



2024

Watershed-based Resource Management Strategy for the Central Lake Ontario Conservation Authority



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1 Purpose

In 2021, the Government of Ontario passed Ontario Regulation 686, which requires that Conservation Authorities develop a Watershed-based Resource Management Strategy.

The Regulation outlines the programs and services that the Province deems mandatory and asks Conservation Authorities to establish guiding principles and objectives that inform the design and delivery of these programs and services, summarize the existing technical studies that direct these programs, and undertake a program review exercise to establish compliance with the new Regulation, evaluate program effectiveness, identify limiting issues, and recommend actions to improve program effectiveness.

The Regulation also invites Conservation Authorities to identify any other programs and services that it offers on behalf of its municipalities or in the interest of furthering the purposes of the *Conservation Authorities Act* and include them in the Strategy. Section 2 provides an overview of all of Central Lake Ontario Conservation Authority's (CLOCA's) programs and services, including technical documents, program assessments, and recommendations for improvement.

This Watershed-based Resource Management Strategy has been developed for the watersheds managed by CLOCA.

About Central Lake Ontario Conservation Authority

Central Lake Ontario Conservation Authority's jurisdiction is within the Traditional and Treaty Territory of the Williams Treaties First Nations and is based upon the watershed boundaries of four major watercourses, draining an area of over 627 sq. km. The four major watercourses which begin with their headwaters in the Oak Ridges Moraine are, from west to east, Lynde Creek, Oshawa Creek, Black / Harmony / Farewell Creeks, and Bowmanville / Soper Creeks. There are 17 additional watersheds which include Warbler, Cranberry, Whitby Shores, Heydenshore, Pump House, Corbett Creek, Pringle Creek, McLaughlin Bay, Robinson Creek, Burk, Tooley, Osborne, Darlington, St. Marys, Westside, Bennett Creek, and Rickard. The municipalities within CLOCA's watershed include the Regional Municipality of Durham, City of Pickering, Town of Ajax, Township of Uxbridge, Township of Scugog, Town of Whitby, City of Oshawa, and the Municipality of Clarington.

A diverse landscape exists within CLOCA's jurisdiction which includes urban and rural settlements (hamlets), agriculture and natural areas. For the most part, the highly urbanized area is situated within the southern portion of the watershed, leaving the northern portion dominated by rural land uses and significant undeveloped natural areas.

There are three major physiographic features within CLOCA's watershed: the Lake Ontario waterfront, Lake Iroquois Beach and the Oak Ridges Moraine. Each of these distinctive landscape features contribute to the overall ecological functions that support healthy watersheds in CLOCA's jurisdiction.

2 Mandatory, Municipal, and other CLOCA Programs and Services

Ontario Reg. 686/21 outlines the programs and services that Conservation Authorities are required to provide. These include:

- managing hazards such as erosion and flooding;
 - forecasting and responding to flood and drought conditions;
 - managing ice;
 - providing guidance on infrastructure development;
 - reviewing and commenting on planning applications;
 - administering and enforcing the *Conservation Authorities Act*
- conserving and managing Conservation Authority lands
- the development and implementation of a watershed-based resource management strategy
- carrying out duties relating to the *Clean Water Act* and Source Water Protection
- participating in provincial groundwater and stream monitoring programs

In addition, CLOCA works with its municipal partners to provide watershed planning, watershed monitoring, information management, and outreach/education services to support the delivery of mandatory programs and equip municipalities with the tools to make responsible and informed land use decisions and to maintain watershed health for the benefit of its residents and adapt to changes in climate.

The **guiding principles** and objectives that inform the design and delivery of these programs and services are derived from CLOCA's Strategic Plan, which was updated in 2021.

Guiding Principles

1 Conserve, restore and enhance natural resources through integrated watershed management.

- Improve understanding of watershed ecosystem and its response to human and natural environmental stressors to support informed resource management decision making.
- Expand network of protected greenspace and Conservation Authority land holdings.
- Implement updated integrated watershed plans and other action plans to guide landuse planning, protection, restoration, and stewardship initiatives.
- Collaborate with partners to reduce the impact of environmental stressors such as climate change.

2 Support healthy communities and the protection of people and property from flooding and erosion.

- Increase capacity to predict flood events and flood-vulnerable areas.
- Provide timely and expert technical advice and land use tools and resources to our partner municipalities.
- Improve understanding of natural hazards to inform risk management actions.
- Mitigate potential risk to people and property from natural hazards through regulation, administration, and compliance.
- Improve flood event warning systems and communication.

3 Remain dedicated to the protection, management, and safety of Conservation Areas.

- Continue to implement a land protection and acquisition strategy; expand Conservation Area land holdings to provide sustainable greenspace.
- Identify appropriate opportunities for enhanced/optimal use, revitalization of Conservation Areas and facilities.
- Enhance ecological integrity of Conservation Areas.
- Provide high-quality, positive and safe experiences in Conservation Areas.
- Design, implement, and manage Conservation Area infrastructure that respects natural heritage features.

4 Create a more knowledgeable and connected watershed community through engagement and education.

- Connect people with nature, culture, and greenspace to promote environmental awareness, appreciation, and action.
- Increase school participation in environmental education and stewardship.
- Provide programs that respond to and reflect a diverse community.
- Communicate a recognized brand that reflects our corporate culture, our goals, and strategic actions to our watershed audiences.

5

Demonstrate business excellence through effective customer service, engaged employees, and innovation.

- Foster provision of efficient, effective, and client-focused programs and services.
- Engage employees with measurable continuous improvement outcomes.
- Establish a strong culture of collaboration.
- Improve corporate sustainability outcomes through operation, procurement, and business practice improvements.
- Continue to strive for diversity, equity, and inclusiveness.
- Continue to modernize data and mapping management resources and services to support stakeholder and corporate priorities.

Central Lake Ontario Conservation Authority relies on numerous technical documents, as well as the extensive experience of its staff, to carry out its mandatory programs and services. A list of these documents has been included in Appendix A.

CLOCA's Programs and Services

Natural Hazard Management

Central Lake Ontario Conservation Authority provides programs and services to manage risks related to natural hazards, including flooding, drought, erosion, wetlands, dynamic beaches, and other hazardous sites and lands. The program includes:

- **Flood forecasting and warning:** Collecting and maintaining data from streamflow gauges, rainfall gauges and snow courses to monitor and forecast conditions, issue warnings for riverine flooding, and maintain communications and emergency response systems. CLOCA also provides support to municipal emergency management personnel.
- **Low-water response:** Coordinate and support delivery of the provincial Ontario Low Water Response Program within its watershed.
- **Natural hazard mapping:** Update and maintain mapping of rivers, streams, floodplains, and other natural hazards, such as wetlands, steep slopes and the Lake Ontario shoreline.
- **Planning and regulations:** A permit is required under Section 28 of the *Conservation Authorities Act* for development and other activities in regulated areas such as floodplains, wetlands, steep slopes along waterways, watercourses and the Lake Ontario shoreline.

Conservation Authority Land and Conservation Areas

Central Lake Ontario Conservation Authority owns over 2,900 hectares of land within its watershed jurisdiction. This land is within the Traditional and Treaty Territory of the Williams Treaties First Nations and includes valley lands, provincially significant wetlands, natural areas, forests, and flood plain lands. The natural value of these properties, and the public investment in these lands, is protected through CLOCA's Land Management Program.

Central Lake Ontario Conservation Authority-owned lands make important contributions to biodiversity and ecosystem functions within the watershed and support passive outdoor recreation, environmental education, and the opportunity for nature appreciation.

Central Lake Ontario Conservation Authority carries out inspections following CLOCA's Conservation Areas Risk Management Policy; facility repair, trail maintenance, and hazard tree work required to maintain public infrastructure for eight public Conservation Areas and 45 kilometers of trails.

Drinking Water Source Protection

In accordance with the *Clean Water Act*, CLOCA carries out activities that support the maintenance of safe drinking water in Ontario.

Watershed Monitoring and Science

Central Lake Ontario Conservation Authority is a partner in provincial programs that monitor the health of its surface water and groundwater resources to ensure long-term quality and quantity for its watershed residents.

In addition, CLOCA carries out annual monitoring in the form of an Integrated Watershed Monitoring Program to enhance its understanding of watershed health, both for the benefit of people and wildlife.

Watershed Management, Natural Heritage Planning and Climate Change

Watershed Planning

Central Lake Ontario Conservation Authority's Watershed Plans for Lynde Creek, Oshawa Creek, Black/ Harmony/ Farewell Creeks, and Bowmanville / Soper Creeks were updated and Board approved in 2020. These updated plans recognize the recent urban, rural, and natural environment conditions present in the watershed, and consider potential future growth, planning policy requirements, and climate change to present specific recommendations to protect CLOCA's natural watershed resources.

Restoration and Stewardship

Central Lake Ontario Conservation Authority uses a range of tools and frameworks developed through the watershed planning process to support strategic prioritization of restoration opportunities across its jurisdiction (the CLOCA Natural Heritage System, Restoration Prioritization Plan Mapping Tool, Wildlife Corridor Protection and

Enhancement Plan, Conservation Area management plans, etc.) and ensure restoration projects are designed and implemented so that they achieve measurable gains in watershed health. Central Lake Ontario Conservation Authority also seeks to incorporate Traditional Indigenous Knowledge and practices into its restoration and stewardship projects.

Central Lake Ontario Conservation Authority has successfully implemented restoration projects on both private lands and CLOCA conservation lands, and continues to support efforts to increase forest cover throughout its jurisdiction.

Climate Change

Central Lake Ontario Conservation Authority works on several fronts to advance its scientific and adaptation knowledge with respect to climate change. In keeping with the recommendations and actions identified through the watershed plan review and update process, CLOCA will be taking a more detailed examination of the impacts of climate change on watershed processes, including identifying climate change adaptation practices to help lessen current and projected impacts.

Core Watershed-based Resource Management Strategy

Central Lake Ontario Conservation Authority works in partnership with its partners and various stakeholders to develop and maintain watershed management plans for each of its watersheds. These plans contain detailed information and maps of natural resources, and models potential future conditions. This science is used to identify informed actions, to achieve sustainable development. Watershed-based planning is key to strategic development, habitat protection, natural hazard mitigation, and climate change adaptation.

The suite of innovative education programs informs and raises awareness about the value of healthy watersheds, educating diverse audiences about CLOCA, what they do and who they are.

Environmental Education

Since 1988, CLOCA has delivered formal and informal education programs to share its watershed story and inspire its community to be watershed champions by taking action for real change. Its education programs are an important deliverable designed to fulfill CLOCA's fourth goal in its Strategic Plan (2021-2025), to create a more knowledgeable and connected watershed through community engagement and education. This includes connecting people with nature, culture and greenspace, to promote environmental awareness, appreciation, and action; increase school participation in environmental education and stewardship; provide programs that respond to and reflect a diverse community; and communicate a recognized brand that reflects its corporate culture, its goals, and strategic actions to its watershed audiences.

3 Programs and Services Assessment

Central Lake Ontario Conservation Authority strives to provide effective programs and services that incorporate current science and take advantage of new technologies.

But it is worth reflecting on the effectiveness of these programs periodically to ensure that they are being provided to the best of CLOCA's abilities. The following sections discuss the compliance, effectiveness, and potential to improve CLOCA's mandatory, municipal, and other programs and services.

Regulation Compliance

Central Lake Ontario Conservation Authority's programs and services are compliant with provincial legislation.

Effectiveness of Programs and Services

Appendix B includes a column that evaluates the effectiveness of each of CLOCA's programs and services, and identifies existing issues or risks to the effective delivery of these programs. Several themes emerged as a result of this evaluation:

1. Climate change was identified as a potential risk to many of CLOCA's programs and services. Climate change is a global issue that has already started impacting locally. In the CLOCA watershed its monitoring program shows rising air temperatures and a shift from traditional spring high flows to more mid-winter melts, early winter floods, and later spring and summer high flows have been observed. Winter snowpacks are shrinking but winter rainfalls are more common. As the climate changes, it will have implications for water temperature,

ice cover, and the frequency and extent of flooding and drought. Climate change impacts all of our programs and services and it is critical that we fully understand these impacts and deliver services that will mitigate impacts and make our watersheds more climate resilient.

2. CLOCA's watershed is located in one of the fastest growing regions in North America. By 2051 its watershed population could increase by 50 per cent. Managing watershed development and growth in a sustainable manner was identified as another potential issue affecting CLOCA's programs and services, particularly as it relates to water quality and quantity, flooding and erosion, and protection of natural resources.
3. The need for adequate and stable funding and staff resources were listed as another potential issue that needs to be addressed to ensure effective delivery of many of CLOCA's programs and services.

Recommendations to improve programs and services

Actions that can be taken to address potential issues or risks to the effective delivery of CLOCA's programs and services are listed in detail in Appendix B. In general, these actions include continued partnerships with Durham Region and CLOCA's municipalities, and maintaining up-to-date Watershed Management Plans to protect important natural resources, support healthy communities, and inform sustainable watershed development.

4 Reviewing and updating the Watershed-based Resource Management Strategy

Central Lake Ontario Conservation Authority is committed to reviewing and updating this strategy every 10 years to ensure that the mandatory programs and services that it is providing remain compliant with the regulation and are effective.

5 Public consultation and publication

Public consultation for this strategy was carried out in the fall of 2024. A draft version of the Strategy was posted on CLOCA's website (www.cloca.com) for public review, and reviewers were invited to complete a survey, to share comments and/or concerns. Central Lake Ontario Conservation Authority's municipal partners, as well as the Mississaugas of Scugog Island First Nations were engaged directly in the review of this document.

All comments were considered and suggested revisions to the Strategy were incorporated where appropriate. The final version of this Strategy is available to the public on CLOCA's website.

Appendix A

Summary of existing technical studies that inform/support delivery of CLOCA's programs and services.

Program	Description/sub-components	Technical Documents
Risks related to Natural Hazards		
Hazard Lands	Dynamic Beach – Lake Ontario Shoreline	Lake Ontario Shoreline Management Plan (Zuzek, 2020) Lake Ontario Shoreline Hazard Summary, Risk Assessment and Management Plan (SJL Engineering, 2022)
	Erosion – Lake Ontario Shoreline	CLOCA Engineering Department Annual Report 2022 Lake Ontario Shoreline Management Plan (Zuzek, 2020) Lake Ontario Shoreline Hazard Summary, Risk Assessment and Management Plan (SJL Engineering, 2022) Technical Guide for Great Lakes – St. Lawrence River Shorelines Part 4 – Erosion Hazard
	Erosion – Riverine	Bennett Creek Watershed Master Drainage Study (TSH, 2008) South Bowmanville Industrial Park Stormwater Drainage Study (Dillon, 1988) Lynde Creek Master Drainage Plan Update (AECOM, 2022) Brooklin Secondary Plan, Stage 3 Final Report (Candevcon, 2018) Kedron Part II Planning Area Master Environmental Servicing Plan (Candevcon, 2019) Northwood Business Park Master Stormwater Management Plan (Greck, 2016) Soper Creek Main and East Branches Subwatershed Study (Aquafor Beech, 2022) Master Drainage Study, Westside Creek (Sernas, 1998) Pringle Creek Master Drainage Plan Update (Candevcon, 2018) Robinson Creek and Tooley Creek Subwatershed Study (Aquafor Beech, 2022) Corbett Creek Master Drainage Plan Update and Floodplain Mapping (TMIG, 2020)

	<p>Bowmanville and Soper Creek Regulatory Floodplain Mapping (Aquafor Beech, 2009)</p> <p>Lynde Creek Regulatory Floodplain Mapping (Earth Tech, 2008)</p> <p>Oshawa Creek Hydrologic and Hydraulic Modeling (CLOCA, 2014)</p>
<p>Flooding – Lake Ontario Shoreline</p>	<p>Bennett Creek Watershed Master Drainage Study (TSH, 2008)</p> <p>Lake Ontario Shoreline Management Plan (Zuzek, 2020)</p> <p>Lake Ontario Shoreline Hazard Summary, Risk Assessment and Management Plan (SJL Engineering, 2022)</p> <p>South Bowmanville Industrial Park Stormwater Drainage Study (Dillon, 1988)</p> <p>Lynde Creek Master Drainage Plan Update (AECOM, 2022)</p> <p>Brooklin Secondary Plan, Stage 3 Final Report (Candevcon, 2018)</p> <p>Kedron Part II Planning Area Master Environmental Servicing Plan (Candevcon, 2019)</p> <p>Northwood Business Park Master Stormwater Management Plan (Greck, 2016)</p> <p>Soper Creek Main and East Branches Subwatershed Study (Aquafor Beech, 2022)</p> <p>Master Drainage Study, Westside Creek (Sernas, 1998)</p> <p>Pringle Creek Master Drainage Plan Update (Candevcon, 2018)</p> <p>Robinson Creek and Tooley Creek Subwatershed Study (Aquafor Beech, 2022)</p> <p>Corbett Creek Master Drainage Plan Update and Floodplain Mapping (TMIG, 2020)</p>
<p>Flooding – Riverine</p>	<p>Two-Zone Floodplain Mapping and Flood Mitigation Study (Greck, 2021)</p> <p>Brooklin Secondary Plan, Stage 3 Final Report (Candevcon, 2018)</p> <p>Kedron Part II Planning Area Master Environmental Servicing Plan (Candevcon, 2019)</p>

	<p>Soper Creek Main and East Branches Subwatershed Study (Aquafor Beech, 2022)</p> <p>Master Drainage Study, Westside Creek (Sernas, 1998)</p> <p>Pringle Creek Master Drainage Plan Update (Candevcon, 2018)</p> <p>Robinson Creek and Tooley Creek Subwatershed Study (Aquafor Beech, 2022)</p> <p>Corbett Creek Master Drainage Plan Update and Floodplain Mapping (TMIG, 2020)</p> <p>CLOCA Watershed Flood-Risk Assessment (April, 2017)</p> <p>Michael Boulevard Flood Mitigation Strategy Final Report (2020)</p> <p>Rowe Channel Upgrade Study Environmental Assessment (2022)</p> <p>West Whitby Comprehensive Floodplain Reduction Report – Interim Condition (Revised, 2019)</p> <p>River and Stream Systems: Erosion Hazard Limit (Technical Guide) – (OMNRF, 2002)</p> <p>River and Stream Systems: Flooding Hazard Limit (Technical Guide) – (OMNRF, 2002)</p> <p>Understanding Natural Hazards (OMNRF, 2001)</p>
Hazardous sites	
Low water/drought	CLOCA Engineering Department Annual Report 2022
Flood forecasting and warning	<p>CLOCA Engineering Department Annual Report 2022</p> <p>Flood Contingency Plan for the Regional Municipality of Durham (CLOCA et al 2017)</p>
Drought/low-water response	CLOCA Engineering Department Annual Report 2022
Ice management	
Infrastructure	<i>Environmental Assessment Act</i>
Commenting on applications and proposals	<p>Technical Guidelines for Stormwater Management Submissions (CLOCA, 2020)</p> <p>Bennett Creek Watershed Master Drainage Study (TSH, 2008)</p>

South Bowmanville Industrial Park Stormwater Drainage Study (Dillon, 1988)

Lake Ontario Shoreline Management Plan (Zuzek, 2020)

Lake Ontario Shoreline Hazard Summary, Risk Assessment and Management Plan (SJL Engineering, 2022)

Lynde Creek Master Drainage Plan Update (AECOM, 2022)

Two-Zone Floodplain Mapping and Flood Mitigation Study (Greck, 2020)

Brooklin Secondary Plan, Stage 3 Final Report (Candevcon, 2018)

Kedron Part II Planning Area Master Environmental Servicing Plan (Candevcon, 2019)

Northwood Business Park Master Stormwater Management Plan (Greck, 2016)

Soper Creek Main and East Branches Subwatershed Study (Aquafor Beech, 2022)

Master Drainage Study, Westside Creek (Sernas, 1998)

Pringle Creek Master Drainage Plan Update (Candevcon, 2018)

Robinson Creek and Tooley Creek Subwatershed Study (Aquafor Beech, 2022)

Corbett Creek Master Drainage Plan Update and Floodplain Mapping (TMIG, 2020)

Hydrogeological Assessment Submissions Conservation Authority Guidelines to Support Development Applications (June 2013) Erosion and Sediment Control Guideline for Urban Construction (CVC/TRCA)

Policy and Procedural Document for Regulation and Plan Review (2014)

Understanding Natural Hazards (MNRF, 2001)

Technical Guide River and Stream systems: Erosion Hazard Limit (MNRF, 2002)

Columbus Part II Plan for the Columbus Planning Area

Black/Harmony/Farewell Creek Watershed Plans – Existing Conditions Report (2011); Watershed Plan (2012); Update (2020)

Bowmanville/Soper Creek Watershed Plans – Existing Conditions Report (2011); Watershed Plan (2013); Update (2020)

Lynde Creek Watershed Plans – Existing Conditions Report (2008); Watershed Plan (2012); Update (2020)

Oshawa Creek Watershed Plans – Existing Conditions Report (2002); Watershed Plan (2002, 2012); Update (2020)

Robinson Creek and Tooley Creek Flood Mitigation Study (TYLin, 2023)

Applicable Regional and Municipal Official Plans and Secondary Plans

Oak Ridges Moraine Groundwater Program (ORMGP) website resources and the Water Budget (or Water Balance) Mapping tool to calculate WB from the regional model

Evaluation, Classification and Management of Headwater Drainage Features Guidelines (CVC/TRCA Jan. 2014)

Low Impact Development Stormwater Management Planning and Design Guide, 2010

Oak Ridges Moraine Conservation Plan (2017)

Provincial Policy Statement (2020)

CLOCA Engineering Department Annual Report 2022

Technical Guidelines for Stormwater Management Submissions (CLOCA, 2020)

Bennett Creek Watershed Master Drainage Study (TSH, 2008)

South Bowmanville Industrial Park Stormwater Drainage Study (Dillon, 1988)

Lake Ontario Shoreline Management Plan (Zuzek, 2020)

Lake Ontario Shoreline Hazard Summary, Risk Assessment and Management Plan (SJL Engineering, 2022)

Two-Zone Floodplain Mapping and Flood Mitigation Study (Greck, 2020)

Lynde Creek Master Drainage Plan Update (AECOM, 2022)

Brooklin Secondary Plan, Stage 3 Final Report (Candevcon, 2018)

Kedron Part II Planning Area Master Environmental Servicing Plan (Candevcon, 2019)

Northwood Business Park Master Stormwater Management Plan (Greck, 2016)

Soper Creek Main and East Branches Subwatershed Study (Aquafor Beech, 2022)

Black/Harmony/Farewell Creek Watershed Plans – Existing Conditions Report (2011); Watershed Plan (2012); Update (2020)

Bowmanville/Soper Creek Watershed Plans – Existing Conditions Report (2011); Watershed Plan (2013); Update (2020)

Lynde Creek Watershed Plans – Existing Conditions Report (2008); Watershed Plan (2012); Update (2020)

Oshawa Creek Watershed Plans – Existing Conditions Report (2002); Watershed Plan (2002, 2012); Update (2020)

Plan Review and Comment

Pringle Creek Master Drainage Plan Update (Candevcon, 2018)

Robinson Creek and Tooley Creek Subwatershed Study (Aquafor Beech, 2022)

Corbett Creek Master Drainage Plan Update and Floodplain Mapping (TMIG, 2020)

Hydrogeological Assessment Submissions Conservation Authority Guidelines to Support Development Applications (June 2013)

Erosion and Sediment Control Guideline for Urban Construction (CVC/TRCA)

Policy and Procedural Document for Land Use Planning and Regulation (2024)

Understanding Natural Hazards (MNR, 2001)

Technical Guide River and Stream Systems: Erosion Hazard Limit (MNR, 2002)

Technical Guide River and Stream Systems: Flooding Hazard Limit (Technical Guide) – (MNR, 2002)

Columbus Part II Plan for the Columbus Planning Area

Robinson Creek and Tooley Creek Flood Mitigation Study (TYLin, 2023)

Regional and Municipal Official Plans and Secondary Plans

Oak Ridges Moraine Groundwater Program (ORMGP) website resources and the Water Budget (or Water Balance) Mapping tool to calculate WB from the regional model

Evaluation, Classification and Management of Headwater Drainage Features Guidelines (CVC/TRCA Jan. 2014)

Low Impact Development Stormwater Management Planning and Design Guide, 2010

Oak Ridges Moraine Conservation Plan (2017)

Provincial Policy Statement (2020)

The Great Lakes – St. Lawrence River System Technical Guide (MNR, 2001)

Watershed Regional and Area Municipal Official Plans and Zoning By-laws

Administration and Enforcement of Act	<p>Policy and Procedural Document Land Use Planning and Regulation (2024)</p> <p>Ontario Regulation 41/24</p> <p><i>Provincial Offences Act</i></p> <p><i>Statutory Powers Procedure Act</i></p>
Conservation and Management of CA Lands	
Administration and Enforcement of Act	<p>Ontario Regulation 688/21</p> <p><i>Conservation Authorities Act</i>, Section 21 and 29</p> <p>Conservation Area Strategy (2024)</p> <p>Conservation Areas Inspection Policy (2023)</p> <p>Ontario Regulation 319/08</p> <p><i>Trespass to Property Act</i></p> <p><i>Occupiers' Liability Act</i></p>
Conservation Area Management Planning	<p>Web of Life: A Plan For Two Dynamic Coastal Wetlands – Lynde Shores Conservation Area Management Plan (1999)</p> <p>Long Sault Conservation Area Management Plan (2004)</p> <p>Bowmanville/Westside Marshes Conservation Area Management Plan (2006)</p>
Land Securement Planning	<p>Heber Down Conservation Area Management Plan (2010)</p> <p>Land Acquisition Strategy (2015)</p> <p>Lake Iroquois Beach Securement Strategy (2015)</p>
Clean Water Act	
Source Water Protection	<p>Approved Source Protection Plan: CTC Source Protection Region (2015, amended 2022)</p> <p>Explanatory Document: CTC Source Protection Region (2015)</p> <p>Background technical documents found here: https://ctcswp.ca/technical-docs/#1496857834805-20d71ec6-ee93</p>
Other programs as defined by regulation 686/21	
Groundwater monitoring program	CLOCA Engineering Department Annual Report 2022
Provincial stream monitoring program	CLOCA Engineering Department Annual Report 2022
Watershed-based resource management strategy	

Municipal and other programs and services

Watershed management and climate change adaptation

Black/Harmony/Farewell Creek Watershed Plans – Existing Conditions Report (2011); Watershed Plan (2012); Update (2020)

Bowmanville/Soper Creek Watershed Plans – Existing Conditions Report (2011); Watershed Plan (2013); Update (2020)

Ecological Services: Valuing Natural Areas within CLOCA (2017)

Flood Damage Centres Upgrading (2017)
High Volume Recharge Area Study (2014)

Imperviousness Report Card (2018)

In-stream Barriers Action Plan (2017)

Integrated Watershed Monitoring Program StoryMap

Invasive Species Management Strategy and Update (2017)

Lake Iroquois Beach Securement Strategy (2015)

Land Acquisition Strategy (2012)

Lichen Pilot Project (2013)

Lynde Creek Watershed Plans – Existing Conditions Report (2008); Watershed Plan (2012); Update (2020)

McLaughlin Bay Restoration Strategy (2013)

Montgomery Creek Restoration Plan (2015)

Oshawa Creek Watershed Plans – Existing Conditions Report (2002); Watershed Plan (2002, 2012); Update (2020)

Policy and procedural document for regulation and plan review (2014)

Restoration Prioritization Supporting Document and Methodology (2019)

Riparian Corridors Restoration Plan (2017)

Wildlife Corridor Protection and Enhancement Plan (2023)

<p>Integrated watershed monitoring</p>	<p>Aquatic Monitoring Program (2009) CLOCA Turtle Monitoring Methodology (2017) CVC Forest IBI (2013) Durham Region Coastal Wetland Methodology Handbook (2007) IWMP Technical Report (2023) Forest Bird Monitoring Program survey protocol (Birds Canada) Golden Horseshoe Fish Index (2023) Marsh Monitoring Program survey protocols (birds and amphibians) – Birds Canada Ontario Stream Assessment Protocol (2017) Ontario Benthic Biomonitoring Protocol (2022) Terrestrial Monitoring Methodology Overview (2019) Terrestrial Monitoring Plant Collection/Photography Protocol (2020) Terrestrial Monitoring Step by Step Monitoring Instructions (2019) Terrestrial Watershed Monitoring (Long Term) (2009)</p>
<p>Outreach and Education</p>	<p>Community Needs and Opportunities for Environmental Education (2018) In Our Watershed; Outdoor Environmental Education Program Guide (CLOCA, 2023)</p>

Appendix B

Programs and Services risk assessment and cost analysis (follows on pages 22-24).

Program/Service	Item	Subservice	Explanation of Subservice	Category: 1-Mandatory 2-Municipal P&S 3-Other	Issue/Risk that could limit the effectiveness of the service	Actions to address the risks	Cost estimate
Natural Hazard Management (Section 21.1 (1) 1 i) (Subsection 1-8)	1	Section 28.1 Permit administration and compliance activities	Reviewing and processing permit applications, associated technical reports, site inspections, communication with applicants, agents, and consultants. Legal expenses for regulations and compliance. Property enquire	1	Insufficient information to make informed decisions; outdated Board approved policies	Ensure hazard mapping is up-to-date; complete necessary technical studies to better understand risk;	In-kind staffing costs; consulting costs TBD
	2	Plan Review under Other Legislation	Input to the review and approval processes under other applicable law, (e.g., Environmental Assessment Act, Drainage Act, Aggregate Resources Act proposals) with comments principally related to natural hazards, wetlands, watercourses and Sec 28 permit requirements.	1	Outdated Board approved natural hazard policies; outdated/insufficient hazard information	Ensure up-to-date Board approved natural hazard policies in the Policies and Procedures Document	In-kind
	3	Municipal Plan Input and Review	Technical information and advice to municipalities on circulated municipal land use planning applications (Official Plan and Zoning By-law Amendments, Subdivisions, Consents, Minor Variances). Input to municipal land-use planning documents (OP, Comprehensive ZB, Secondary plans) related to natural hazards, on behalf of MNRF (delegated to CAs in 1983)	1	Outdated natural hazard policies in Official Plans; insufficient knowledge/information to provide technical advice	Continue to update watershed and resource management plans as a basis to the provision of technical advice to municipalities	In-kind costs
	4	Flood Forecasting and Warning	Daily data collection and monitoring of weather forecasts, provincial and local water level forecasts and watershed conditions. Flood event forecasting. Flood warning and communications. Maintenance of equipment.	1	Insufficient information to make informed forecasts; inadequate monitoring equipment; ineffective modelling to predict changing climate conditions	Continue to invest in natural hazard monitoring; continue to work with partners to understand how future climate conditions impact natural hazards	See 2023 CLOCA budget
	5	Flood Plain and Erosion Mapping	Data collection, analysis and identification of areas susceptible to riverine or coastal flooding to create mapping products to delineate flood-prone and erosion hazard areas.	1	Inadequate funding to update flood plain mapping; inadequate information/data to identify hazard limits; delineation of hazard limits that are not informed on climate change scenarios	Continue to seek funding opportunities to support updated hazard mapping and identifying 10 year funding needs to update (asset management planning)	\$200,000 annually will fund one watershed floodplain mapping
	6	Low Water Response	Conditions monitoring/analysis. Technical and administrative support to the Water Response Team representing major water users and decision makers, who recommend drought response actions.	1	Inadequate staffing or monitoring equipment	Seek funding opportunities for summer contract support	\$25,000 annually
	7	Natural Hazards Technical Studies and Information Management	Data collection and study of designs to mitigate natural hazards. Development and use of systems to collect and store data and to provide spatial geographical representations of data. Includes Shoreline hazard studies	1	Inadequate funding to complete needed studies	Identify 10-year funding needs to complete needed studies (asset management planning)	See #5 above
	8	Natural Hazards Communications, Outreach and Education	Promoting public awareness of natural hazards including flooding, drought, and erosion. Public events, materials. Social media services. Media relations.	1	Ensuring public receives messages	Continue to explore alternative means of communication and messaging.	In-kind
	9	Watershed Stewardship and Restoration related to natural hazards	Apply for and manage external funding, promote private land stewardship, outreach, provide advice and design assistance to property owners as it relates to mitigation of flooding through wetland restoration and environmental restoration mitigating climate change impacts.	1	Lack of public awareness and stewardship/restoration opportunities	Promote public awareness through social media	In-kind
	10	Climate change impact assessment /Planning and Policies related to natural hazard mgmt.	Identification of vulnerability or risk, and the development of mitigation and adaptation policies and plans implementing the Region Climate Change Plan.	2	Lack of public awareness and stewardship/restoration opportunities	Promote public awareness through social media	In-kind
Conservation Authority Land and Conservation Areas (Section 21.1 (1) 1 ii) (Subsection 9-11)	11	Section 29 Minister's regulation Rules for Conduct in Conservation Areas (O. Reg. 688/21)	Conservation areas enforcement/ compliance & Legal expenses for regulation and compliance	1	Insufficient funds for adequate staff resources to actively prioritize this work on a regular basis; increasing number of visitors having potential to result in negative experience	Consider increased enforcement and education resources in step with increased users.	TBD
	12	Conservation Area Strategy - NOTE: Strategy to be completed on or before December 31, 2024 per requirements in Section 10 of the Mandatory Programs and Services Regulation	Guiding principles, objectives, including for an authority's land acquisition and disposition strategy, land use categories on conservation authority owned land, recommended management principles for different land categories, etc.	1	Insufficient staff resources to dedicate adequate time to this new regulatory requirement; insufficient funds to complete the action items/recommendations included in the Conservation Area Strategy	Re-work staff work plans to prioritize delivery of this product within the regulated timelines.	In-kind
	13	Land Inventory - NOTE: Inventory to be completed on or before December 31, 2024 per requirements in Section 11 of the Mandatory Programs and Services Regulation	Development of an inventory containing information for every parcel of land owned or controlled by the Authority.	1			
	14	Management, operation and Maintenance of CA owned lands	Management and Maintenance of CA owned lands including: Stewardship and restoration, and, Ecological monitoring programs and services to maintain any facilities, trails or other amenities that support public access and recreational activities in conservation areas	1	Adequate funding for ecological stewardship and restoration; adequate funding for ecological monitoring programs and services; adequate funding for trail maintenance and aging infrastructure	Seek funding opportunities and process efficiencies	In-kind

Program/Service	Item	Subservice	Explanation of Subservice	Category: 1-Mandatory Municipal P&S Other	2- 3-	Issue/Risk that could limit the effectiveness of the service	Actions to address the risks	Cost estimate
	15	Land Acquisition	Acquisition of lands containing important natural heritage features that aligns with CLOCA Land Securement Strategy	3		Adequate funding	Establish land acquisition reserve and seek greater support from all levels of government as well as private support	TBD
	16	Rental property expenses	Management of current property rentals. Revenue from these rentals offset the costs associated with management and are reflected in line item 14.	3				
Drinking Water Source Protection (Section 21.1 (1) iii) (Subsection 13)	17	Source protection authority role as set out in the Clean Water Act.	Source Protection Area/Region, tech support, SPC support, SPA reports and meetings, activities required by the Clean Water Act and regulations that applies to the authority's source protection area.	1				
Water Quality & Quantity Monitoring (Section 21.1 (1) 2 (Subsection 12(2) and 12(3))	18	Provincial Water Quality Monitoring Network (PWQMN)	A long-standing (50+ years) CA/MECP partnership for stream water quality monitoring. CA takes water samples; MECP does lab analysis and data management	1		Potential lack of sustainable funding	Monitor ongoing Integrated Watershed Monitoring Program needs and identify 10-year funding needs to maintain or improve statistical power of the long-term monitoring results (integrated watershed monitoring program planning)	In-kind
	19	Surface water Monitoring	Integrated Watershed Monitoring Program	3		Potential lack of sustainable funding	Monitor ongoing Integrated Watershed Monitoring Program needs and identify 10-year funding needs to maintain or improve statistical power of the long-term monitoring results (integrated watershed monitoring program planning)	In-kind
	20	Provincial Groundwater Monitoring Network (PGMN)	A long-standing (20+ year) CA/MECP partnership for groundwater level and quality monitoring.	1				
	21	ORM Groundwater Program	Groundwater Partnership Program funded through Toronto Region CA Levy from participating municipalities. Program includes intermittent work related to Source Water Protection such as delineation of updated wellhead protection areas and use of data and modelling.	1		Partner agencies don't effectively use website to inform decision making	Continue to promote program and enhance website	In-kind
	22	ORM Groundwater Program	Groundwater Partnership Program funded through Toronto Region CA Levy from participating municipalities. Program includes work related to general groundwater resource management	2		Partner agencies don't effectively use website to inform decision making	Continue to promote program and enhance website	In-kind
	23	Strategy Development - NOTE: Strategy to be completed on or before December 31, 2024	Develop of watershed plans that provide guiding principles and objectives that inform the design and delivery of programs and services the CA is required to provide. Includes the develop a process for periodic review including procedures to engage/consult with stakeholders and the public. Strategy development must include a stakeholder and public consultation component	1		Insufficient staff resources to dedicate adequate time to this new regulatory requirement; future regulatory changes that are more prescriptive and increase the complexity of completing this deliverable in a timely manner	Re-work staff work plans to prioritize delivery of this product within the regulated timelines	In-kind staffing costs
	24	Sub-watershed planning not related to natural hazards	Partner developed plan which identifies streams, wetlands, forests, groundwater recharge areas, and other natural areas. It includes an inventory of plants, animals, birds, and other species. Information on stream flows, water quality, groundwater movement and other natural features is also included. The plan contains policies and implementation actions to protect, enhance and improve the health of the area.	2				

Program/Service	Item	Subservice	Explanation of Subservice	Category: 1-Mandatory Municipal P&S Other	2- 3-	Issue/Risk that could limit the effectiveness of the service	Actions to address the risks	Cost estimate
Core Watershed-based Resource Management Strategy (Section 21.1 (1) 2) (Subsection 12(4)-(9))	25	Natural Heritage Planning	Natural heritage monitoring, plans/strategies system design and mapping outside of conservation areas	3		Loss of core funding support for Integrated Watershed Monitoring Program; gaps in monitoring can significantly impact the statistical significance of trend analyses and the long-term value of the monitoring program, reducing CLOCA's ability to confidently report on overall watershed health trends; insufficient staff resources to undertake watershed planning and implement related recommendations or action plans	Monitor ongoing Integrated Watershed Monitoring Program needs and identify 10-year funding needs to maintain or improve statistical power of the long-term monitoring results (integrated watershed monitoring program planning); work with municipal partners to coordinate natural heritage monitoring needs for long-term watershed planning; work with municipal partners to identify additional opportunities for CLOCA delivered technical services for natural heritage assessment, monitoring, and restoration on municipally owned greenspaces	In-kind staffing costs for long-term program planning exercise; future staff and program costs dependent on goals outlined in the long-term program planning exercise)
	26	Oshawa Consortium Water Monitoring Program	Agreement with City of Oshawa and Ontario Tech University related to Oshawa Creek water quality monitoring	2		Monitoring supported through this partnership is integral to CLOCA's jurisdiction-wide water quality monitoring program; if this funding were to disappear, CLOCA would have to find similar funds from other sources to maintain consistent long-term monitoring levels	Manage partnership over time and ensure a long-term return on investment from this monitoring program	In-kind
	27	Watershed Natural Heritage Stewardship and Restoration not related to natural hazards	Apply for and manage external funding, promote private land stewardship, outreach, provide advice and design assistance to property owners. Implementation of watershed plan stewardship recommendations	3		Lack of public awareness of stewardship/restoration opportunities	Promote public awareness through social media	In-kind
	29	Climate change impact assessment /Planning and Policies	Identification of natural hazard and natural heritage vulnerability or risk, and the development of mitigation and adaptation plans and actions implementing the Regions Climate Change Plan.	2		Inadequate staff resources or funding to complete needed studies; inadequate guidance for incorporating climate change with natural hazards	Leverage climate change impact assessment work recently completed by Lake Simcoe, Toronto and Region, Credit Valley, and Halton Conservation Authorities to inform planning process applicable to the CLOCA jurisdiction	In-kind staffing costs; consulting costs TBD
	29	Climate change impact assessment /Planning and Policies	Identification of natural heritage vulnerability or risk, and the development of mitigation and adaptation policies and plans as part of watershed health report	3		Inadequate staff resources or funding to complete needed studies		In-kind staffing costs; consulting costs TBD
	30	Conservation/ Outdoor Education - Curriculum delivery not related to natural hazards	Program development and delivery	3		Stable funding for ongoing activities	Continue to support increased self-generated revenue.	In-kind
	31	Nature Interpretative services not related to natural hazards	Event/Festival development and execution	3		Inadequate municipal and corporate sponsorship and funding	Ensure events deliver value for supporters	Cost recovery from user fees for events including Maple Syrup Festival. Regional support for Water Festival (see 2023 budget)
	32	SNAP - Sustainable Neighborhood Action Program.	Identifies creative retrofit solutions based on the unique environmental and socio-economic context and local community interests.	3		Insufficient staff resources beyond current pilot	Showcase value to program to obtain long term sustainable funding	TBD
Enabling Program Services: Program costs that are required to run the organization	33	Corporate Services	Administrative, human resources, operating and capital costs including overhead and support costs	1		Staff turnover, retirements and knowledge transfer	Offer competitive salaries and maintain good records and policies and procedural documents	In-kind and salary compensation adjustments
	34	Financial Services	Accounting and payroll	1		Adapting to new CA Act budgeting requirements	Regular meetings with Durham Region	In-kind
	35	Corporate Legal Expenses	Costs related to agreements/contracts, administrative by-law updates	1		Increasing legal expenses and not consistent year to year	Establish long-term legal expense forecasts and legal reserve fund	TBD
	36	Communications and Marketing	Supporting delivery of products and programs through communication platforms and promotion of revenue generating activities; websites creation and maintenance	1		Awareness of Corporate Communication needs	Establish formal liaison meetings with internal departments	In-kind
	37	Governance	Supporting CA Board and Office of CAO	1		Maintaining up to date admin by-law	Implement 5-year review of by-law	In-kind
	38	Asset Management	Asset management planning, facilities and property management	1		Adequate funding for asset replacement	Maintain up-to-date Asset Management Plan	In-kind
	39	Information Technology Management/GIS	Data management, records retention. Development and use of systems to collect and store data and to provide spatial geographical representations of data.	1		Cyber security	Cyber insurance and staff training	In-kind